

0. About Programs

Program Language: C# 5.0 based on .NET Framework 4.5

Libraries: Standard library of .NET(ex: mscorlib.dll, System.Core.dll, System.Linq.dll)

Compiler: C# Compiler in Visual Studio 2012 Update 4 (Any CPU)

Type of Executable File: .exe

Requirements: OS that supports .NET Framework 4.5(ex: Windows 7, 8, 8.1)

1. Integer Stack

1-(a). ADT

structure IntStack

▷ Integer Stack

objects: a finite ordered integer list.

functions: ($\forall stack \in IntStack, item \in \mathbb{Z}, stack_size \in \mathbb{N}$)

IntStack **CREATE**(*stack_size*)

return empty stack which size is *stack_size*

IntStack **PUSH**(*stack*, *item*)

if (# of elements in *stack* = *stack_size*) **throw** exception
insert *item* on top of *stack* and **return** *stack*

int **POP**(*stack*)

if (# of elements in *stack* = 0) **throw** exception
remove and **return** *item* which is in top of *stack*

1-(b). ADT Implemented

Source File: IntStack.cs

1-(c). Program

Executable File: Program1.exe

Source Files: IntStack.cs, Program1.cs

Instruction: Program1.inst.txt

Sample Input, Output: Program1.sample.txt

2. Priority Queue ADT for Flight Reservation

2-(a). ADT

structure QFR ▷ Queue for Flight Reservation

objects: a finite flight reservation lists with same priority

functions: ($\forall queue \in QFR, name \in \Sigma^+, queue_size \in \mathbb{N}$)

QFR **CREATE**(*queue_size*)

return empty queue which size is *queue_size*

QFR **ENQUEUE**(*queue*, *name*)

if (# of elements in *queue* = *queue_size*) **throw** exception

insert *name* at back of *queue* and **return** *queue*

string **DEQUEUE**(*queue*)

if (# of elements in *queue* = 0) **throw** exception

remove and **return** *name* which is in front of *queue*

structure PQFR

▷ Priority Queue for Flight Reservation

objects: a finite flight reservation lists

functions: ($\forall pQueue \in PQFR, queue \in QFR, name \in \Sigma^+, prior \in \{1, 2, 3\}, queue_size \in \mathbb{N}$)

PQFR **CREATE**(*queue_size*)

return set of 3 empty QFR which size is *queue_size*

PQFR **ENQUEUE**(*pQueue*, *name*, *prior*)

if (# of elements in *prior*th queue = *queue_size*) **throw** exception

ENQUEUE(*prior*th queue in *pQueue*, *name*) and **return** *pQueue*

string **DEQUEUE**(*pQueue*)

if (# of total elements in *pQueue* = 0) **throw** exception

for *i* := 1 to 3

let *queue* := *i*th queue in *pQueue*

if (# of elements in *queue* > 0) **return** **DEQUEUE**(*queue*)

2-(b). ADT Implemented

Source Files: SeatQueue.cs(QFR), ReservationQueue.cs(PQFR)

2-(c). Program

Executable File: Program2.exe

Source Files: SeatQueue.cs, ReservationQueue.cs, Program2.cs

Instruction: Program2.inst.txt

Sample Input, Output: Program2.sample.txt